**Red Ribbon seaweed as a new species for mariculture in Alaska**

Quarterly Report

April – September 30, 2025

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This project is investigating methods to achieve open water aquaculture of the red alga, *Devaleraea mollis*. The overall methodology is to collect fertile tetrasporic plants in the late spring from the low intertidal and to bring the plants to the lab where spore release is attempted.

At the end of April and May wild seaweed collections were made at various shore locations near Juneau. Two incubators at the UAF CFOS Lena Point facility were set up with four different light and temperature parameters (Table 1).

Table 1. Four daylength, temperature and light intensity parameters for the release of tetraspores from *Devaleraea mollis*.

| Conditions | Day/Night | Temperature | Light intensity |
|---|---|---|---|
| Long days, bright light | 16L:8D | 8˚C | 100 µmol/$m^2$/s |
| Long days, dim light | 16L:8D | 8˚C | 40 µmol/$m^2$/s |
| Neutral days, bright light | 12L:12D | 8˚C | 100 µmol/$m^2$/s |
| Neutral days, dim light | 12L:12D | 8˚C | 40 µmol/$m^2$/s |

The dulse was harvested four times over the course of April and May and placed in autoclaved seawater cultures in the four parameters to induce spore release. Water was changed weekly, and F/2 and germanium dioxide were administered weekly. For a substrate for the spores to settle on, 6 x 6.5 cm acrylic settlement plates were created and wrapped with Cremona string.

The first spore release occurred 05/15/25 in 16L:8D, 100 µmol. After the first, there were several more spore releases and at least 20 cultures of spores on Cremona string have been established (from May to July). Spores were seen in all experimental parameters except 12L:12D, 40 µmol, 8˚C. In addition to the string cultures, tumble cultures from the spores have also been established. Weekly water changes continued for cultures still in the incubators.

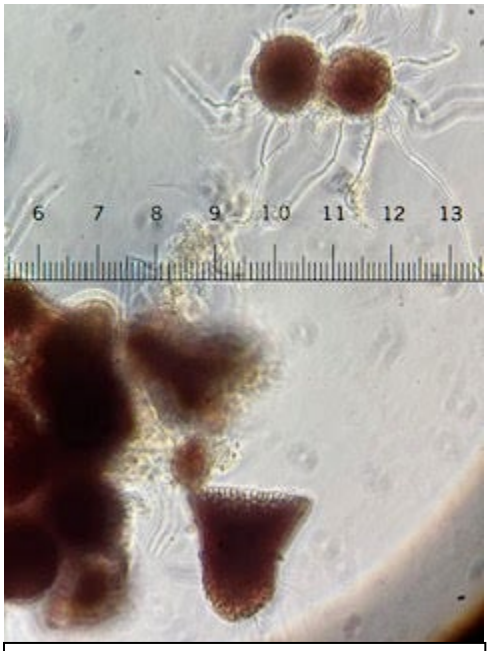
The first out-planting occurred mid-June at the Coghlan Island farm site. Three dropper lines were constructed with 6 cm sections of the Cremona string placed on the lines from 0 meters every 0.5 meters up to 5 meters below the water surface. Seaweed sizes at the farm sight, off Coghlan Island in Juneau, were measured monthly. Another outplanting occurred in August. At this point the original deployed seaweed was pulled out due to bleaching of the blades and minimal growth. The August deployment employed three dropper lines, but the 6 cm sections of string were placed every 1 meter from 0 meters to 10 meters below the surface.

At each farm site visit, water samples were collected at 0 meters, 2 meters, 5 meters and 10 meters deep. Water temperature and salinity were taken every meter from 0m to 10m. A third out-planting will occur mid-October. These dropper lines will also be seeded every 1 meter from 0 meters to 10 meters deep. Growth is monitored by measuring the length of the five longest blades at each depth before outplanting and then measured monthly thereafter.

All the blades that are growing are likely to be male gametophytes as the female gametophytes do not form blades until fertilized. However, the female gametophytes are likely still adhered to the Cremona string.

In early July, seaweed was collected in Cordova by our NVE partners and sent to Juneau. Cultures were set up for them as well. Three separate small spore releases have occurred from the Cordova collection, but only in two of the experimental parameters 16L:8D, 100 µmol/$m^2$/s and 8˚C; 16L:8D, 40 µmol/$m^2$/s and 8˚C. Five spore Cremona cultures have been established from the Cordova collection, and one tumble culture has been set up.

Images below are all seaweed grown from spores and the farm site:




Male and female spores. Female top right. Male bottom middle

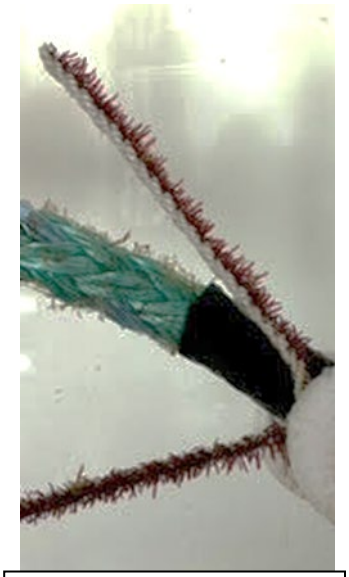
Male blades at one month

Tumbling blades at 2 months

Recently settled spores on Cremona wrapped plates.

Settled seaweed on Cremona wrapped plates at 2 months.

Farm site at Coghlan Island, Juneau Alaska



Blades at 2 months ready for outplanting. Between 0.5 and 1 mm

Blades after one month of out-planting at 7 meters

Blades after one month of out-planting at 5 meters